

A NEW SPECIES OF *HELMINTHOGLYPTA*  
(GASTROPODA: PULMONATA: HELMINTHOGLYPTIDAE)  
FROM SAN DIEGO COUNTY, CALIFORNIA

Richard L. Reeder and Walter B. Miller

*Abstract.*—*Helminthoglypta montezuma* is described from California. The species differs from its nearest consubgenera in having densely granulose shell sculpture. Relationships within the genus are discussed.

Henry A. Pilsbry's magnificent compilation of information on the western land snail genus *Helminthoglypta* Ancey, 1887 (Pilsbry 1939), has remained the most complete and authoritative reference to date for workers studying this genus. Anatomical data are lacking for many species and subspecies listed, however, and their systematic position may therefore be incorrect. During the period 1956-1964, the late W. O. Gregg and the second author conducted a series of field explorations in southern California for the express purpose of collecting from known populations of *Helminthoglypta* in the region, and using the material for comparative morphological study. In the process, new populations were discovered and some were found to be undescribed species. One such new species from Montezuma Valley in San Diego County is described below.

Helminthoglyptidae Pilsbry, 1939

*Helminthoglypta* Pilsbry, 1939

*Helminthoglypta montezuma*, new species

Figs. 1, 2

*Description of holotype.*—Shell small, depressed, helicoid, umbilicate, with umbilicus contained about 8 times in diameter of shell. Color light brown with pale, chestnut band on rounded shoulder. Aperture nearly round, with peristome thickened, only slightly reflected, expanded slightly more at columellar insertion. Embryonic shell of 1½ whorls, smooth. Post-embryonic whorls

with radial growth wrinkles, covered with such dense numbers of minute papillae as to appear granulose. Papillae tend to be in descending spiral rows on second and third whorls, randomly distributed on later whorls and continuing strongly on to base of shell and into umbilicus. Diameter 17.4 mm, height 10.1 mm, diameter of umbilicus 2.2 mm, number of whorls 4¾.

*Reproductive anatomy of holotype.*—The genital system is typical of the genus, with an atrial sac having a dart sac at its proximal end, the latter structure being relatively small. There are two mucous glands with mucous bulbs, the ducts of which unite to form a single duct before entering the atrial sac. The spermatheca is spherical and the spermathecal duct bears a diverticulum of moderate length. The penis has a short, narrow lower chamber and a longer, wider, double-walled upper chamber of uniform diameter. The lumen of the upper penis expands broadly in its lower half. The penis forms a continuous tube with the epiphallus which is of moderate length and bears an epipallic caecum at its proximal end, also of moderate length. The penial retractor muscle attaches to the epiphallus. Measurements of distinctive organs are as follows:

Penis	11.4 mm
Epiphallus	12.3 mm
Epipallic caecum	9.1 mm
Spermathecal duct	24.0 mm
Spermathecal diverticulum	18.6 mm



Fig. 1. Shell of holotype of *Helminthoglypta montezuma* (SBMNH 33917). Dorsal, apertural, and umbilical views. Diameter 17.4 mm.

*Variation in paratypes.*—A total of 19 adult and 15 juvenile shells was examined. The largest adult paratype is 19.6 mm in diameter and 11.0 mm in height, and the smallest 14.2 mm and 8.1 mm respectively. All of the shells exhibit the characteristic granulose condition and narrow umbilicus. Five reproductive anatomies were examined; all exhibited the same cylindrical shape of uniform diameter, and the same upper and lower penis.

*Disposition of type material.*—Holotype: Santa Barbara Museum of Natural History no. 33917. Paratypes: The Academy of Natural Sciences of Philadelphia no. 359265; U.S.N.M. no. 842310; W. B. Miller collection nos. 4302, 4306 and 7490; R. L. Reeder collection no. 685; H. L. Fairbanks collection no. 459.

*Type locality.*—San Diego County, California; in rocks among oaks along north side of Montezuma Valley Road from 1.0–2.0 road miles east of junction with San Felipe

Road; 33°13.0'N, 116°35.5'W; elevation 1040 m (3440 ft.).

*Discussion.*—The anatomy of *H. montezuma* clearly indicates that the species belongs in the nominate subgenus. Its nearest consubgeneric relatives are *H. thermimontis* Berry, 1953, *H. waltoni* Gregg and Miller, 1976, and *H. milleri* Reeder, 1985. It differs from all three in that it has densely granulose shell sculpture while the others are only moderately papillose. It is also consistently smaller than the other species, with a maximum diameter ranging from 14.2 to 19.6 mm while the smallest of the others is 21.8 mm for *H. thermimontis*. Its umbilicus, likewise, is narrower, ranging from 2.1 to 2.8 mm, while the others range from 3.2 to 4.3 mm. Its anatomy, while similar to that of the other three, does have certain distinctive features involving the shape of the penis. In *H. waltoni* the upper penis is decidedly club-shaped. In *H. thermimontis*, the upper penis is cylindrical for most of its

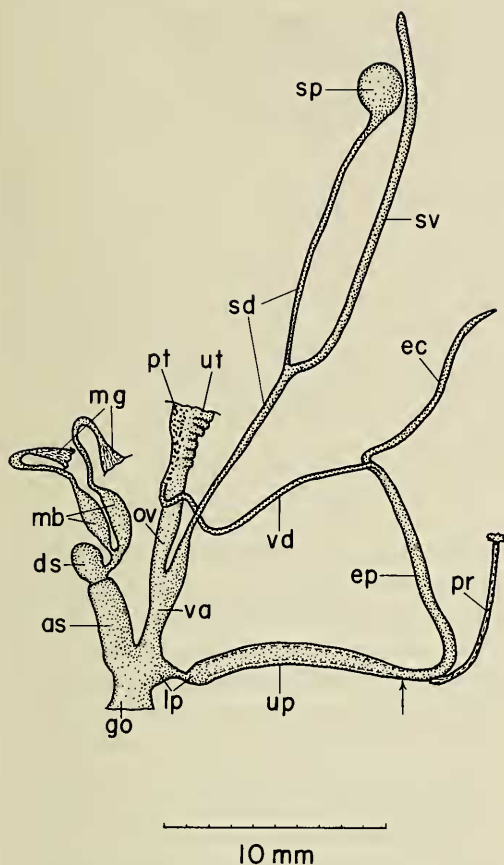


Fig. 2. Portion of reproductive system of *Helminthoglypta montezuma* Reeder and Miller, showing diagnostic characters. Drawing made from projection of stained whole mount, #4302-DT; arrow shows junction of upper penis and epiphallus. as—atrial sac; ds—dart sac; ec—epiphallal caecum; ep—epiphallus; go—genital orifice; lp—lower part of penis; mb—mucous gland bulbs; mg—mucous gland membranes; ov—oviduct; pr—penial retractor muscle; pt—prostate; sd—spermathecal duct; sp—spermatheca; sv—spermathecal diverticulum; up—upper part of penis; ut—uterus; va—vagina; vd—vas deferens.

length and then tapers to the smaller initial diameter of the venturi-shaped lower penis; the venturi portion is extremely narrow. In *H. montezuma*, the upper penis is cylindri-

cal for all of its length, joining a lower penis of equal initial diameter. In *H. milleri*, the upper and lower penes have essentially the same characteristics as in *H. montezuma* except that the venturi portion is consistently wider.

*Helminthoglypta montezuma* is currently known only from the type locality in Montezuma Valley. Vegetation at this locality consists primarily of *Quercus dumosa*, *Quercus agrifolia*, *Cercocarpus betuloides*, *Rhus ovata*, *Artemesia tridentata*, *Photinia arbutifolia*, *Adenostoma fasciculatum*, *Berberis pinnata*, and *Symphoricarpos* sp.

*Etymology*.—This species is named for Montezuma Valley, California, where it lives.

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#### Literature Cited

- Pilsbry, Henry A. 1939. Land mollusca of North America (north of Mexico).—Academy of Natural Sciences of Philadelphia Monographs (3)1(1): i-xviii + 1-573 + i-ix; figs. A, B, 1-377.

(RLR) Faculty of Biological Science, University of Tulsa, Tulsa, Oklahoma 74104; (WBM) Department of Ecology and Evolutionary Biology, The University of Arizona, Tucson, Arizona 85721.